

RELATION OF SNOWFALL TO THE YIELD OF WINTER WHEAT.

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The value of snow as a protective measure to winter wheat is a subject on which authorities do not agree, and the writer does not contend that the statements presented in this paper serve to offer a solution of the question, but the data may be of interest. There are many elements entering into the problem that make it quite complex. Among these are the distribution of the snow, both geographically and by time, the condition as to snow cover during periods of extreme cold, freezing and

Of the 9 years that the wheat yield was below normal, the snowfall of the previous winter was above normal in 7 and normal in 1. Of these 7 winters the mean temperature was below normal in 4. From this it will be seen that the winters of heavy snowfall have not as a rule been followed by large wheat yields.

The winter of the greatest snowfall, a cold winter, was followed by the poorest wheat yield but one. The

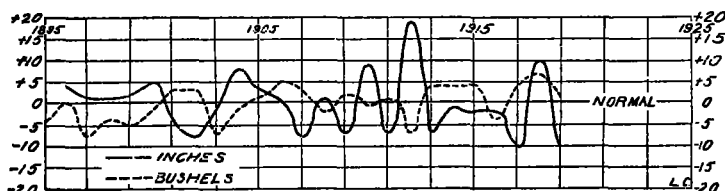


FIG. 1.—The departure of snowfall from the average, by winters for Illinois, in inches, and the departure of the yield of winter wheat for the following season from the average, for Illinois, in bushels.

thawing, rainfall or drought during the autumn and spring, excessive heat, insect pests, and plant diseases.

Omitting consideration of the above-named elements, diagrams have been prepared (figs. 1-4) showing the yields of winter wheat and the snowfall, mean and lowest winter temperatures in the preceding winters, with respect to the averages of these features for the period of record. The wheat data are furnished by the Bureau of Crop Estimates; the temperature and snowfall data

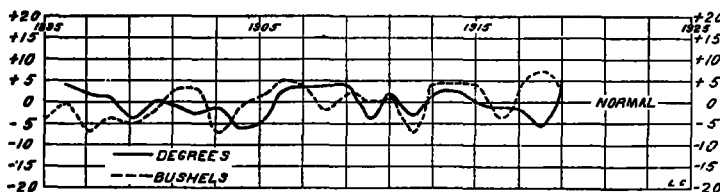


FIG. 2. The departure of mean temperature from the normal, by winters (December, January, February), for Illinois, in degrees Fahrenheit, and the departure of the yield of winter wheat for the following season from the average, for Illinois, in bushels.

are compiled from the records of all meteorological stations in Illinois, numbering 86 at the present time.

A study of the diagrams shows that of the 13 years when the wheat yield was above the average, the snowfall of the previous winter was below the average in 10. Of these 10 winters the mean temperature was above normal in 6, and normal in 2. This indicates that, generally speaking, the best wheat years were preceded by winters with less than the normal snowfall, but that in most of those winters the temperature was normal or above.

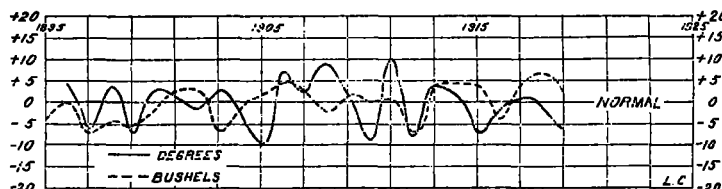


FIG. 3.—The departure of the absolute minimum temperature from the average by winters (December, January, February), for Illinois, in degrees Fahrenheit, and the departure of the yield of winter wheat for the following season from the average, for Illinois, in bushels.

winter of the least snowfall (1918-19), a mild winter, bid fair at the close of winter to be followed by a record wheat crop. In the early spring the crop was in a most excellent condition, but later disease and adverse weather conditions caused considerable deterioration.

The cold winters have heavy snowfall and the mild winters have light snowfall. This is due to the facts; (1) that during the mild winters much of the precipitation

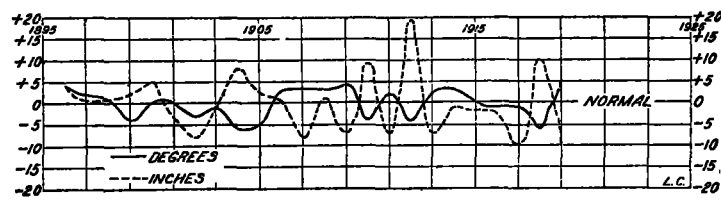


FIG. 4. The departure from the normal snowfall, by winters, for Illinois, in inches, and the departure from the normal mean temperature, by winters (December, January, February), for Illinois, in degrees Fahrenheit.

falls as rain; and (2) that a snow-cover tends to make the surface air colder.¹

Considering only the elements of total snowfall and mean temperature, it would appear that the winters of light snowfall are followed by good wheat yields, and the winters of heavy snowfall are followed by light yields. However, this may be due in part to the fact that the temperature is less severe in the winters of light snowfall.

¹ See MONTHLY WEATHER REVIEW, Dec., 1918, 46: 573-574.